UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,815	08/21/2003	Jerome R. Bellegarda	P2989-908	6190

62665 7590 01/22/2010

BUCHANAN INGERSOLL & ROONEY, PC
P.O. BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER	
DWIVEDI, MAHESH H	

ART UNIT	PAPER NUMBER
2168	

NOTIFICATION DATE	DELIVERY MODE
01/22/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/644,815	BELLEGARDA ET AL.	
	Examiner	Art Unit	
	MAHESH H. DWIVEDI	2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,9-11,13-23,25-28,30-33,35-38 and 48-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9-11,13-23,25-28,30-33,35-38 and 48-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/20/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Remarks

1. Receipt of Applicant's Amendment, filed on 10/30/2009, is acknowledged. The amendment includes the cancellation of claims 8, 12, 24, 29, 34, and 39-47, and the addition of claims 48-57.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 08/20/2009 has been received, entered into the record, and considered. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-7, 11, 13-16, 17-23, 27-28, 30-34, 37-38, 48, 50, 52, 54, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bellegarda et al.** (Article entitled "Exploiting Latent Semantic Information in Statistical Language Modeling", dated 10/26/2000) and in view of **Oliver et al.** (U.S. Patent 7,158,986).

5. Regarding claim 1, **Bellegarda** teaches a method comprising:

A) mapping the files into a semantic vector space (Page 1279, Abstract);

B) clustering the files within said space (Page 1279, Abstract).

C) wherein multiple threshold values that are settable to desired levels of granularity are defined, and said files are clustered based on said multiple threshold values (Page 1284)

The examiner notes that **Bellegarda** teaches **"mapping the files into a semantic vector space"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be

applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract). The examiner further notes that **Bellegarda** teaches **"clustering the files within said space"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract). The examiner further notes that **Bellegarda** teaches **"wherein multiple threshold values that are settable to desired levels of granularity are defined, and said files are clustered based on said multiple threshold values"** as "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck, 1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284).

Bellegarda does not explicitly teach:

D) deriving a hierarchy of plural level of clusters from said clustering;

E) displaying the files in a hierarchical format of plural level of clusters based on said derived hierarchy.

Oliver, however, teaches **"deriving a hierarchy of plural level of clusters from said clustering"** as "In the preferred embodiment of the invention, the recommendation software uses a statistical process referred to herein as document clustering to group together those documents of the client document server that have been viewed by the user according to their common themes and concepts. For each individual user, the recommendation software clusters those documents that have the most themes and concepts in common with one another into interest folders 505. In the

preferred embodiment, the recommendation software continually monitors each user and continually updates the user's interest folders and profile" (Column 12, lines 44-54) and "In the preferred embodiment of the present invention, the recommendation software uses a proprietary clustering algorithm to form the user interest folders. The clustering algorithm uses the textual content of the documents viewed by a user, in combination with structural information about the document server, and ancillary information about the user to determine the interest folders for a user" (Column 13, lines 10-16), and **"displaying the files in a hierarchical format of plural level of clusters based on said derived hierarchy"** as "One significant feature of the clustering algorithm used by the invention is that the output of the algorithm can be readily viewed and understood. Each document cluster (interest folder) is described by the most relevant keywords of the documents within the document cluster 510. This feature enables both users and marketers to understand and control the degree of personalization and targeting that is made" (Column 13, lines 22-28) and "FIG. 6 is an example of a user profile 600 generated by the recommendation software, according to the preferred embodiment of the present invention. The profile shown in the personalized Web page of FIG. 6 comprises two different interest folders 602, 604 for a user of an on-line auction Web site. Each interest folder contains pages which are intrinsically similar to one another and dissimilar to pages in other interest folders. A specific interest folder contains a set of links 610 to auctions the user has viewed that are related to the theme of the interest folder. An interest folder can also include additional information including but not limited to information regarding the history of the user's Internet viewing, recommendations for the user, a summary of the user's purchases. In the example illustrated in FIG. 6, each interest folder also has an associated set of keywords 612 that summarize the most important concepts of the particular interest folder, as determined by the recommendation software" (Column 14, lines 30-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching

Oliver's would have allowed **Bellegarda's** to provide a method o provide automated organization for users, as noted by **Oliver** (Column 3, lines 23-32).

Regarding claim 2, **Bellegarda** does not explicitly teach a method comprising:
A) wherein the step of clustering the files is performed as a background routine during the operation of a computer associated with said file system.

Oliver, however, teaches **"wherein the step of clustering the files is performed as a background routine during the operation of a computer associated with said file system"** as "In the preferred embodiment, the recommendation software continually monitors each user and continually updates the user's interest folders and profile" (Column 12, lines 52-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Oliver's** would have allowed **Bellegarda's** to provide a method o provide automated organization for users, as noted by **Oliver** (Column 3, lines 23-32).

Regarding claim 3, **Bellegarda** further teaches a method comprising:
A) wherein the step of clustering the files is performed in response to the creation of a new file within the file system (Page 1286, Section: A. Framework Extension).

The examiner notes that **Bellegarda** teaches **"wherein the step of clustering the files is performed in response to the creation of a new file within the file system"** as "finding a new representation for a new document in the space S is straightforward" (Page 1286, Section: A. Framework Extension). The examiner further notes that it is clear that the method of **Bellegarda** clusters when a new document is noticed.

Regarding claim 4, **Bellegarda** further teaches a method comprising:
A) wherein said files are text documents (Page 1279, Abstract); and
B) said mapping is conducted on the basis of a language model (Page 1279, Abstract).

The examiner notes that **Bellegarda** teaches **"wherein said files are text documents"** as "This paper focuses on the use of latent semantic analysis, a paradigm that automatically uncovers the salient semantic relationships between words and documents in a given corpus" (Page 1279, Abstract). The examiner further notes that **Bellegarda** teaches **"said mapping is conducted on the basis of a language model"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract).

Regarding claim 5, **Bellegarda** further teaches a method comprising:
A) wherein said mapping step comprises the steps of constructing a matrix which associates each word in the documents with a vector (Page 1281, Section: A. Feature Extraction, Section: B. Singular Value Decomposition); and
B) associates each document with a vector (Page 1281, Section: A. Feature Extraction, Section: B. Singular Value Decomposition).

The examiner notes that **Bellegarda** teaches **"wherein said mapping step comprises the steps of constructing a matrix which associates each word in the documents with a vector"** as "The starting point is the construction of a matrix (W) of co-occurrences between words and documents" (Page 1281, Section: A. Feature Extraction) and "The (M x N) word-document matrix W resulting from the above feature extraction defines two vector representations for the words and the documents. Each word ω_i can be uniquely associated with a row vector of dimension N, and each document d_j can be uniquely associated with a column vector of dimension M (Page 1281, Section: B. Singular Value Decomposition). The examiner further notes that **Bellegarda** teaches **"associates each document with a vector"** as "The (M x N) word-document matrix W resulting from the above feature extraction defines two vector representations for the words and the documents. Each word ω_i can be uniquely

associated with a row vector of dimension *N*, and each document d_j can be uniquely associated with a column vector of dimension *M*" (Page 1281, Section: B. Singular Value Decomposition).

Regarding claim 6, **Bellegarda** further teaches a method comprising:
A) the step of decomposing said matrix to define the words and documents as vectors in a continuous vector space (Page 1281, Section: A. Feature Extraction, Section: B. Singular Value Decomposition).

The examiner notes that **Bellegarda** teaches **"the step of decomposing said matrix to define the words and documents as vectors in a continuous vector space"** as "To address these issues, it is useful to employ a singular value decomposition (SVD), a technique closely related to eigenvector decomposition and factor analysis" (Page 1281, Section: B. Singular Value Decomposition).

Regarding claim 7, **Bellegarda** further teaches a method comprising:
A) wherein said clustering is performed by identifying documents whose vectors are within a threshold distance of one another (Page 1284, Section: A. Word Clustering).

The examiner notes that **Bellegarda** teaches **"wherein said clustering is performed by identifying documents whose vectors are within a threshold distance of one another"** as "This opens up the opportunity to apply familiar clustering techniques in S, as long as a distance measure consistent with the SVD formalism is defined on the vector space" (Page 1286, Section: A. Framework Extension).

Regarding claim 11, **Bellegarda** teaches a graphical user interface comprising:
A) a virtual file system (Page 1279, Abstract); and
B) clustering said files based on multiple threshold values that are settable to desired levels of granularity (Page 1284).

The examiner notes that **Bellegarda** teaches **"a virtual file system with a semantic hierarchy, wherein the semantic hierarchy is based on clustering of files based on semantic similarities"** as "(discrete) words and documents are mapped

onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract). The examiner further notes that **Bellegarda** teaches **"clustering said files based on multiple threshold values that are settable to desired levels of granularity"** as "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck, 1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284).

Bellegarda does not explicitly teach:

A) A graphical user interface configured to display files with a semantic hierarchy of plural levels of clusters that is derived from semantic similarities of said files;

C) determining a directory structure having plural levels of clusters based on the clustering determined from similarities between said files, wherein the graphical user interface graphically presents the determined directory structure having plural levels of clusters to be displayed on a display device.

Oliver, however, teaches **"A graphical user interface configured to display files with a semantic hierarchy of plural levels of clusters that is derived from semantic similarities of said files"** as "In the preferred embodiment of the invention, the recommendation software uses a statistical process referred to herein as document clustering to group together those documents of the client document server that have been viewed by the user according to their common themes and concepts. For each individual user, the recommendation software clusters those documents that have the most themes and concepts in common with one another into interest folders 505. In the preferred embodiment, the recommendation software continually monitors each user

and continually updates the user's interest folders and profile" (Column 12, lines 44-54) and "In the preferred embodiment of the present invention, the recommendation software uses a proprietary clustering algorithm to form the user interest folders. The clustering algorithm uses the textual content of the documents viewed by a user, in combination with structural information about the document server, and ancillary information about the user to determine the interest folders for a user" (Column 13, lines 10-16), and **"determining a directory structure having plural levels of clusters based on the clustering determined from similarities between said files, wherein the graphical user interface graphically presents the determined directory structure having plural levels of clusters to be displayed on a display device"** as "In the preferred embodiment of the invention, the recommendation software uses a statistical process referred to herein as document clustering to group together those documents of the client document server that have been viewed by the user according to their common themes and concepts. For each individual user, the recommendation software clusters those documents that have the most themes and concepts in common with one another into interest folders 505. In the preferred embodiment, the recommendation software continually monitors each user and continually updates the user's interest folders and profile" (Column 12, lines 44-54), "In the preferred embodiment of the present invention, the recommendation software uses a proprietary clustering algorithm to form the user interest folders. The clustering algorithm uses the textual content of the documents viewed by a user, in combination with structural information about the document server, and ancillary information about the user to determine the interest folders for a user" (Column 13, lines 10-16), "One significant feature of the clustering algorithm used by the invention is that the output of the algorithm can be readily viewed and understood. Each document cluster (interest folder) is described by the most relevant keywords of the documents within the document cluster 510. This feature enables both users and marketers to understand and control the degree of personalization and targeting that is made" (Column 13, lines 22-28) and "FIG. 6 is an example of a user profile 600 generated by the recommendation software, according to the preferred embodiment of the present invention. The profile shown in

the personalized Web page of FIG. 6 comprises two different interest folders 602, 604 for a user of an on-line auction Web site. Each interest folder contains pages which are intrinsically similar to one another and dissimilar to pages in other interest folders. A specific interest folder contains a set of links 610 to auctions the user has viewed that are related to the theme of the interest folder. An interest folder can also include additional information including but not limited to information regarding the history of the user's Internet viewing, recommendations for the user, a summary of the user's purchases. In the example illustrated in FIG. 6, each interest folder also has an associated set of keywords 612 that summarize the most important concepts of the particular interest folder, as determined by the recommendation software" (Column 14, lines 30-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Oliver's** would have allowed **Bellegarda's** to provide a method o provide automated organization for users, as noted by **Oliver** (Column 3, lines 23-32).

Regarding claim 13, **Bellegarda** does not explicitly teach a graphical user interface comprising:

A) wherein clustering of the files is initiated by user selection.

Oliver, however, teaches **"wherein clustering of the files is initiated by user selection"** as "While the present invention is designed to automatically match users with relevant content, it is recognized that a client might wish to customize the manner in which users receive special promotions, event announcements and special news items. In the example of the Roman coin collector, a marketer of cruises might wish to target the collector with a promotion for a cruise of the Mediterranean" (Column 15, lines 23-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Oliver's** would have allowed **Bellegarda's** to provide a method o provide automated organization for users, as noted by **Oliver** (Column 3, lines 23-32).

Regarding claim 14, **Bellegarda** further teaches a graphical user interface comprising:

A) wherein clustering of the files is initiated upon creation of a new file in the file system (Page 1286, Section: A. Framework Extension).

The examiner notes that **Bellegarda** teaches **"wherein clustering of the files is initiated upon creation of a new file in the file system"** as "finding a new representation for a new document in the space S is straightforward" (Page 1286, Section: A. Framework Extension). The examiner further notes that it is clear that the method of **Bellegarda** clusters when a new document is noticed.

Regarding claim 15, **Bellegarda** further teaches a graphical user interface comprising:

A) wherein text files are clustered utilizing a language model (Page 1279, Abstract).

The examiner notes that **Bellegarda** teaches **"analyzing files in a file system to determine similarities in data pertaining to their content"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract).

Bellegarda does not explicitly teach:

B) non-text files are clustered utilizing rule-based techniques.

Oliver, however, teaches **"non-text files are clustered utilizing rule-based techniques"** as "The marketing system sends the recommended document(s), or a link to the recommended document(s) back to the client's document server 430. The recommendations can include but are not limited to URLs, product numbers, advertisements, products, animations, graphic displays, sound files, and applets that are selected, based on the user profile, to be interesting and relevant to the user. For example, the most relevant ad for any page can be rapidly determined by comparing the

current user profile with the description of the available advertisements" (Column 11, lines 36-45) and "While the present invention is designed to automatically match users with relevant content, it is recognized that a client might wish to customize the manner in which users receive special promotions, event announcements and special news items. In the example of the Roman coin collector, a marketer of cruises might wish to target the collector with a promotion for a cruise of the Mediterranean" (Column 15, lines 23-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Oliver's** would have allowed **Bellegarda's** to provide a method o provide automated organization for users, as noted by **Oliver** (Column 3, lines 23-32).

Regarding claim 16, **Bellegarda** further teaches a graphical user interface comprising:

A) wherein said language model comprises the LSA paradigm (Page 1281, Section: D. Organization).

The examiner notes that **Bellegarda** teaches **"wherein said language model comprises the LSA paradigm"** as "The focus of this paper is on semantically driven span extension only, and more specifically on how the LSA paradigm can be exploited to improve statistical language modeling" (Page 1281, Section: D. Organization).

Regarding claim 17, **Bellegarda** teaches a computer-readable media comprising:

A) analyzing files in a file system to determine similarities in data pertaining to their content (Page 1279, Abstract);

B) clustering said files based on multiple threshold values that are settable to desired levels of granularity (1284);

The examiner notes that **Bellegarda** teaches **"analyzing files in a file system to determine similarities in data pertaining to their content"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a

powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract). The examiner further notes that **Bellegarda** teaches **"clustering said files based on multiple threshold values that are settable to desired levels of granularity"** as "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck, 1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284).

Bellegarda does not explicitly teach:

C) determining a directory structure having plural levels of clusters based on the clustering determined from similarities between the files;

D) displaying files in hierarchical format of plural levels of clusters based on the clustering determined from similarities between the files.

Oliver, however, teaches **"determining a directory structure having plural levels of clusters based on the clustering determined from similarities between the files"** as "In the preferred embodiment of the invention, the recommendation software uses a statistical process referred to herein as document clustering to group together those documents of the client document server that have been viewed by the user according to their common themes and concepts. For each individual user, the recommendation software clusters those documents that have the most themes and concepts in common with one another into interest folders 505. In the preferred embodiment, the recommendation software continually monitors each user and continually updates the user's interest folders and profile" (Column 12, lines 44-54), "In the preferred embodiment of the present invention, the recommendation software uses a proprietary clustering algorithm to form the user interest folders. The clustering

algorithm uses the textual content of the documents viewed by a user, in combination with structural information about the document server, and ancillary information about the user to determine the interest folders for a user" (Column 13, lines 10-16), "One significant feature of the clustering algorithm used by the invention is that the output of the algorithm can be readily viewed and understood. Each document cluster (interest folder) is described by the most relevant keywords of the documents within the document cluster 510. This feature enables both users and marketers to understand and control the degree of personalization and targeting that is made" (Column 13, lines 22-28) and "FIG. 6 is an example of a user profile 600 generated by the recommendation software, according to the preferred embodiment of the present invention. The profile shown in the personalized Web page of FIG. 6 comprises two different interest folders 602, 604 for a user of an on-line auction Web site. Each interest folder contains pages which are intrinsically similar to one another and dissimilar to pages in other interest folders. A specific interest folder contains a set of links 610 to auctions the user has viewed that are related to the theme of the interest folder. An interest folder can also include additional information including but not limited to information regarding the history of the user's Internet viewing, recommendations for the user, a summary of the user's purchases. In the example illustrated in FIG. 6, each interest folder also has an associated set of keywords 612 that summarize the most important concepts of the particular interest folder, as determined by the recommendation software" (Column 14, lines 30-46), and **"displaying files in hierarchical format of plural levels of clusters based on the clustering determined from similarities between the files"** as "One significant feature of the clustering algorithm used by the invention is that the output of the algorithm can be readily viewed and understood. Each document cluster (interest folder) is described by the most relevant keywords of the documents within the document cluster 510. This feature enables both users and marketers to understand and control the degree of personalization and targeting that is made" (Column 13, lines 22-28) and "FIG. 6 is an example of a user profile 600 generated by the recommendation software, according to the preferred embodiment of the present invention. The profile shown in the

personalized Web page of FIG. 6 comprises two different interest folders 602, 604 for a user of an on-line auction Web site. Each interest folder contains pages which are intrinsically similar to one another and dissimilar to pages in other interest folders. A specific interest folder contains a set of links 610 to auctions the user has viewed that are related to the theme of the interest folder. An interest folder can also include additional information including but not limited to information regarding the history of the user's Internet viewing, recommendations for the user, a summary of the user's purchases. In the example illustrated in FIG. 6, each interest folder also has an associated set of keywords 612 that summarize the most important concepts of the particular interest folder, as determined by the recommendation software" (Column 14, lines 30-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Oliver's** would have allowed **Bellegarda's** to provide a method o provide automated organization for users, as noted by **Oliver** (Column 3, lines 23-32).

Regarding claim 18, **Bellegarda** further teaches a computer-readable media comprising:

A) wherein said files are text documents (Page 1279, Abstract); and

B) the similarities are based upon the word content of the files (Page 1281, Section: A. Feature Extraction, Section: B. Singular Value Decomposition).

The examiner notes that **Bellegarda** teaches **"wherein said files are text documents"** as "This paper focuses on the use of latent semantic analysis, a paradigm that automatically uncovers the salient semantic relationships between words and documents in a given corpus" (Page 1279, Abstract). The examiner further notes that **Bellegarda** teaches **"the similarities are based upon the word content of the files"** as "The starting point is the construction of a matrix (*W*) of co-occurrences between words and documents" (Page 1281, Section: A. Feature Extraction) and "The (*M* x *N*) word-document matrix *W* resulting from the above feature extraction defines two vector representations for the words and the documents. Each word ω_i can be uniquely

associated with a row vector of dimension *N*, and each document d_j can be uniquely associated with a column vector of dimension *M* (Page 1281, Section: B. Singular Value Decomposition).

Regarding claim 19, **Bellegarda** further teaches a computer-readable media comprising:

A) wherein said similarities are determined in accordance with a language model (Page 1279, Abstract, Page 1281, Section: D. Organization); and

B) the files are clustered in accordance with said model (Page 1279, Abstract, Page 1281, Section: D. Organization).

The examiner notes that **Bellegarda** teaches **"wherein said similarities are determined in accordance with a language model"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract). The examiner further notes that **Bellegarda** teaches **"the files are clustered in accordance with said model"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract).

Regarding claim 20, **Bellegarda** further teaches a computer-readable media comprising:

A) wherein said language model comprises the LSA paradigm (Page 1281, Section: D. Organization).

The examiner notes that **Bellegarda** teaches **"wherein said language model comprises the LSA paradigm"** as "The focus of this paper is on semantically driven

span extension only, and more specifically on how the LSA paradigm can be exploited to improve statistical language modeling" (Page 1281, Section: D. Organization).

Regarding claim 21, **Bellegarda** further teaches a computer-readable media comprising:

A) wherein said computer-executable code performs the steps of constructing a matrix which associates each word in the documents with a vector (Page 1281, Section: A. Feature Extraction, Section: B. Singular Value Decomposition); and

B) associates each document with a vector (Page 1281, Section: A. Feature Extraction, Section: B. Singular Value Decomposition).

The examiner notes that **Bellegarda** teaches **"wherein said computer-executable code performs the steps of constructing a matrix which associates each word in the documents with a vector"** as "The starting point is the construction of a matrix (*W*) of co-occurrences between words and documents" (Page 1281, Section: A. Feature Extraction) and "The (*M* x *N*) word-document matrix *W* resulting from the above feature extraction defines two vector representations for the words and the documents. Each word ω_l can be uniquely associated with a row vector of dimension *N*, and each document d_j can be uniquely associated with a column vector of dimension *M* (Page 1281, Section: B. Singular Value Decomposition). The examiner further notes that **Bellegarda** teaches **"associates each document with a vector"** as "The (*M* x *N*) word-document matrix *W* resulting from the above feature extraction defines two vector representations for the words and the documents. Each word ω_l can be uniquely associated with a row vector of dimension *N*, and each document d_j can be uniquely associated with a column vector of dimension *M*" (Page 1281, Section: B. Singular Value Decomposition).

Regarding claim 22, **Bellegarda** further teaches a computer-readable media comprising:

A) wherein said computer-executable code further performs step of decomposing said matrix to define the words and documents as vectors in a continuous vector space (Page 1281, Section: A. Feature Extraction, Section: B. Singular Value Decomposition).

The examiner notes that **Bellegarda** teaches **"wherein said computer-executable code further performs step of decomposing said matrix to define the words and documents as vectors in a continuous vector space"** as "To address these issues, it is useful to employ a singular value decomposition (SVD), a technique closely related to eigenvector decomposition and factor analysis" (Page 1281, Section: B. Singular Value Decomposition).

Regarding claim 23, **Bellegarda** further teaches a computer-readable media comprising:

A) wherein said computer-executable code performs clustering by identifying documents whose vectors are within a threshold distance of one another (Page 1284, Section: A. Word Clustering).

The examiner notes that **Bellegarda** teaches **"wherein said computer-executable code performs clustering by identifying documents whose vectors are within a threshold distance of one another"** as "This opens up the opportunity to apply familiar clustering techniques in S, as long as a distance measure consistent with the SVD formalism is defined on the vector space" (Page 1286, Section: A. Framework Extension).

Regarding claim 27, **Bellegarda** further teaches a computer-readable media comprising:

A) wherein the computer executable code performs the following steps: clustering text files within the file system using semantic similarities (Page 1279, Abstract).

The examiner notes that **Bellegarda** teaches **"a semantic hierarchy that is based upon the content of said files"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering

techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract).

Bellegarda does not explicitly teach:

B) clustering non-text files within the files system using rule-based techniques;

C) labeling the resulting clusters; and

D) displaying the files in a hierarchical format based on the resulting clusters and labels.

Olliver, however, teaches **"clustering non-text files within the files system using rule-based techniques"** as "The marketing system sends the recommended document(s), or a link to the recommended document(s) back to the client's document server 430. The recommendations can include but are not limited to URLs, product numbers, advertisements, products, animations, graphic displays, sound files, and applets that are selected, based on the user profile, to be interesting and relevant to the user. For example, the most relevant ad for any page can be rapidly determined by comparing the current user profile with the description of the available advertisements" (Column 11, lines 36-45) and "While the present invention is designed to automatically match users with relevant content, it is recognized that a client might wish to customize the manner in which users receive special promotions, event announcements and special news items. In the example of the Roman coin collector, a marketer of cruises might wish to target the collector with a promotion for a cruise of the Mediterranean" (Column 15, lines 23-29), **"labeling the resulting clusters"** as "FIG. 6 is an example of a user profile 600 generated by the recommendation software, according to the preferred embodiment of the present invention. The profile shown in the personalized Web page of FIG. 6 comprises two different interest folders 602, 604 for a user of an on-line auction Web site. Each interest folder contains pages which are intrinsically similar to one another and dissimilar to pages in other interest folders. A specific interest folder contains a set of links 610 to auctions the user has viewed that are related to the theme of the interest folder. An interest folder can also include additional information including but not limited to information regarding the history of the user's

Internet viewing, recommendations for the user, a summary of the user's purchases. In the example illustrated in FIG. 6, each interest folder also has an associated set of keywords 612 that summarize the most important concepts of the particular interest folder, as determined by the recommendation software" (Column 14, lines 30-46), and **"displaying the files in a hierarchical format based on the resulting clusters and labels"** as "One significant feature of the clustering algorithm used by the invention is that the output of the algorithm can be readily viewed and understood. Each document cluster (interest folder) is described by the most relevant keywords of the documents within the document cluster 510. This feature enables both users and marketers to understand and control the degree of personalization and targeting that is made" (Column 13, lines 22-28) and "FIG. 6 is an example of a user profile 600 generated by the recommendation software, according to the preferred embodiment of the present invention. The profile shown in the personalized Web page of FIG. 6 comprises two different interest folders 602, 604 for a user of an on-line auction Web site. Each interest folder contains pages which are intrinsically similar to one another and dissimilar to pages in other interest folders. A specific interest folder contains a set of links 610 to auctions the user has viewed that are related to the theme of the interest folder. An interest folder can also include additional information including but not limited to information regarding the history of the user's Internet viewing, recommendations for the user, a summary of the user's purchases. In the example illustrated in FIG. 6, each interest folder also has an associated set of keywords 612 that summarize the most important concepts of the particular interest folder, as determined by the recommendation software" (Column 14, lines 30-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Oliver's** would have allowed **Bellegarda's** to provide a method o provide automated organization for users, as noted by **Oliver** (Column 3, lines 23-32).

Regarding claim 28, **Bellegarda** teaches a computer system comprising:

A) a file system storing files (Page 1279, Abstract);

C) a processor for analyzing the content of files stored in said file system to map said files into a semantic vector space, cluster the files within said space based on multiple threshold values that are settable to desired levels of granularity (Pages 1279 and 1284, Abstract);

The examiner notes that **Bellegarda** teaches **"a file system storing files"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract). The examiner further notes that **Bellegarda** teaches **"a processor for analyzing the content of files stored in said file system to map said files into a semantic vector space, cluster the files within said space based on multiple threshold values that are settable to desired levels of granularity"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract) and "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck, 1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284).

Bellegarda does not explicitly teach:

B) a display device; and

D) derive a hierarchy of plural levels of clusters from said clustering;

E) a user interface which displays representations of files stored in said file system in the form of said derived hierarchy of plural level of clusters.

Oliver, however, teaches **"a display device"** as "FIG. 6 is an example of a user profile 600 generated by the recommendation software, according to the preferred embodiment of the present invention. The profile shown in the personalized Web page of FIG. 6 comprises two different interest folders 602, 604 for a user of an on-line auction Web site. Each interest folder contains pages which are intrinsically similar to one another and dissimilar to pages in other interest folders. A specific interest folder contains a set of links 610 to auctions the user has viewed that are related to the theme of the interest folder. An interest folder can also include additional information including but not limited to information regarding the history of the user's Internet viewing, recommendations for the user, a summary of the user's purchases. In the example illustrated in FIG. 6, each interest folder also has an associated set of keywords 612 that summarize the most important concepts of the particular interest folder, as determined by the recommendation software" (Column 14, lines 30-46), **"derive a hierarchy of plural levels of clusters from said clustering"** as "In the preferred embodiment of the invention, the recommendation software uses a statistical process referred to herein as document clustering to group together those documents of the client document server that have been viewed by the user according to their common themes and concepts. For each individual user, the recommendation software clusters those documents that have the most themes and concepts in common with one another into interest folders 505. In the preferred embodiment, the recommendation software continually monitors each user and continually updates the user's interest folders and profile" (Column 12, lines 44-54) and "In the preferred embodiment of the present invention, the recommendation software uses a proprietary clustering algorithm to form the user interest folders. The clustering algorithm uses the textual content of the documents viewed by a user, in combination with structural information about the document server, and ancillary information about the user to determine the interest folders for a user" (Column 13, lines 10-16), and **"a user interface which displays representations of files stored in said file system in the form of said derived**

hierarchy of plural level of clusters" as "One significant feature of the clustering algorithm used by the invention is that the output of the algorithm can be readily viewed and understood. Each document cluster (interest folder) is described by the most relevant keywords of the documents within the document cluster 510. This feature enables both users and marketers to understand and control the degree of personalization and targeting that is made" (Column 13, lines 22-28) and "FIG. 6 is an example of a user profile 600 generated by the recommendation software, according to the preferred embodiment of the present invention. The profile shown in the personalized Web page of FIG. 6 comprises two different interest folders 602, 604 for a user of an on-line auction Web site. Each interest folder contains pages which are intrinsically similar to one another and dissimilar to pages in other interest folders. A specific interest folder contains a set of links 610 to auctions the user has viewed that are related to the theme of the interest folder. An interest folder can also include additional information including but not limited to information regarding the history of the user's Internet viewing, recommendations for the user, a summary of the user's purchases. In the example illustrated in FIG. 6, each interest folder also has an associated set of keywords 612 that summarize the most important concepts of the particular interest folder, as determined by the recommendation software" (Column 14, lines 30-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Oliver's** would have allowed **Bellegarda's** to provide a method o provide automated organization for users, as noted by **Oliver** (Column 3, lines 23-32).

Regarding claim 30, **Bellegarda** further teaches a computer system comprising:
A) wherein said files are text documents (Page 1279, Abstract); and
B) said processor maps said files on the basis of a language model (Page 1279, Abstract).

The examiner notes that **Bellegarda** teaches **"wherein said files are text documents"** as "This paper focuses on the use of latent semantic analysis, a paradigm

that automatically uncovers the salient semantic relationships between words and documents in a given corpus" (Page 1279, Abstract). The examiner further notes that **Bellegarda** teaches **"said processor maps said files on the basis of a language model"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract).

Regarding claim 31, **Bellegarda** further teaches a computer system comprising:
A) wherein said processor constructs a matrix which associates each word in the documents with a vector (Page 1281, Section: A. Feature Extraction, Section: B. Singular Value Decomposition); and
B) associates each document with a vector (Page 1281, Section: A. Feature Extraction, Section: B. Singular Value Decomposition).

The examiner notes that **Bellegarda** teaches **"wherein said processor constructs a matrix which associates each word in the documents with a vector"** as "The starting point is the construction of a matrix (*W*) of co-occurrences between words and documents" (Page 1281, Section: A. Feature Extraction) and "The (*M* x *N*) word-document matrix *W* resulting from the above feature extraction defines two vector representations for the words and the documents. Each word ω_l can be uniquely associated with a row vector of dimension *N*, and each document d_j can be uniquely associated with a column vector of dimension *M* (Page 1281, Section: B. Singular Value Decomposition). The examiner further notes that **Bellegarda** teaches **"associates each document with a vector"** as "The (*M* x *N*) word-document matrix *W* resulting from the above feature extraction defines two vector representations for the words and the documents. Each word ω_l can be uniquely associated with a row vector of dimension *N*, and each document d_j can be uniquely associated with a column vector of dimension *M*" (Page 1281, Section: B. Singular Value Decomposition).

Regarding claim 32, **Bellegarda** further teaches a computer-readable media comprising:

A) wherein said processor further decomposes said matrix to define the words and documents as vectors in a continuous vector space (Page 1281, Section: A. Feature Extraction, Section: B. Singular Value Decomposition).

The examiner notes that **Bellegarda** teaches **"wherein said processor further decomposes said matrix to define the words and documents as vectors in a continuous vector space"** as "To address these issues, it is useful to employ a singular value decomposition (SVD), a technique closely related to eigenvector decomposition and factor analysis" (Page 1281, Section: B. Singular Value Decomposition).

Regarding claim 33, **Bellegarda** further teaches a computer system comprising:

A) wherein said processor clusters the files by identifying documents whose vectors are within a threshold distance of one another (Page 1284, Section: A. Word Clustering).

The examiner notes that **Bellegarda** teaches **"wherein said processor clusters the files by identifying documents whose vectors are within a threshold distance of one another"** as "This opens up the opportunity to apply familiar clustering techniques in S, as long as a distance measure consistent with the SVD formalism is defined on the vector space" (Page 1286, Section: A. Framework Extension).

Regarding claim 37, **Bellegarda** does not explicitly teach a method comprising:

A) wherein said deriving step includes organizing the clusters into a hierarchical directory structure.

Oliver, however, teaches **"wherein said deriving step includes organizing the clusters into a hierarchical directory structure"** as "In the preferred embodiment of the invention, the recommendation software uses a statistical process referred to herein as document clustering to group together those documents of the client document server that have been viewed by the user according to their common themes

and concepts. For each individual user, the recommendation software clusters those documents that have the most themes and concepts in common with one another into interest folders 505. In the preferred embodiment, the recommendation software continually monitors each user and continually updates the user's interest folders and profile" (Column 12, lines 44-54), "In the preferred embodiment of the present invention, the recommendation software uses a proprietary clustering algorithm to form the user interest folders. The clustering algorithm uses the textual content of the documents viewed by a user, in combination with structural information about the document server, and ancillary information about the user to determine the interest folders for a user" (Column 13, lines 10-16), "One significant feature of the clustering algorithm used by the invention is that the output of the algorithm can be readily viewed and understood. Each document cluster (interest folder) is described by the most relevant keywords of the documents within the document cluster 510. This feature enables both users and marketers to understand and control the degree of personalization and targeting that is made" (Column 13, lines 22-28) and "FIG. 6 is an example of a user profile 600 generated by the recommendation software, according to the preferred embodiment of the present invention. The profile shown in the personalized Web page of FIG. 6 comprises two different interest folders 602, 604 for a user of an on-line auction Web site. Each interest folder contains pages which are intrinsically similar to one another and dissimilar to pages in other interest folders. A specific interest folder contains a set of links 610 to auctions the user has viewed that are related to the theme of the interest folder. An interest folder can also include additional information including but not limited to information regarding the history of the user's Internet viewing, recommendations for the user, a summary of the user's purchases. In the example illustrated in FIG. 6, each interest folder also has an associated set of keywords 612 that summarize the most important concepts of the particular interest folder, as determined by the recommendation software" (Column 14, lines 30-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching

Oliver's would have allowed **Bellegarda's** to provide a method o provide automated organization for users, as noted by **Oliver** (Column 3, lines 23-32).

Regarding claim 38, **Bellegarda** teaches a method comprising:
A) mapping all words of the plurality of documents and the plurality of documents in a semantic vector space (Page 1279, Abstract);
B) generating a plurality of clusters based on the semantic similarities of the plurality of documents and multiple threshold values that are settable to desired levels of granularity (Pages 1279 and 1284, Abstract).

The examiner notes that **Bellegarda** teaches **"mapping all words of the plurality of documents and the plurality of documents in a semantic vector space"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract). The examiner further notes that **Bellegarda** teaches **"generating a plurality of clusters based on the semantic similarities of the plurality of documents and multiple threshold values that are settable to desired levels of granularity"** as "(discrete) words and documents are mapped onto a (continuous) semantic vector space, in which familiar clustering techniques can be applied. This leads to the specification of a powerful framework for automatic semantic classification, as well as the derivation of several language model families with various smoothing properties" (Page 1279, Abstract) and "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck,

1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284).

Bellegarda does not explicitly teach:

C) organizing the plurality of clusters into directories in a hierarchical format of plural levels of clusters;

D) displaying the plurality of documents in said hierarchical format of plural levels of clusters based on a result of clustering the plurality of documents.

Oliver, however, teaches **"organizing the plurality of clusters into directories in a hierarchical format of plural levels of clusters"** as "In the preferred embodiment of the invention, the recommendation software uses a statistical process referred to herein as document clustering to group together those documents of the client document server that have been viewed by the user according to their common themes and concepts. For each individual user, the recommendation software clusters those documents that have the most themes and concepts in common with one another into interest folders 505. In the preferred embodiment, the recommendation software continually monitors each user and continually updates the user's interest folders and profile" (Column 12, lines 44-54) and "In the preferred embodiment of the present invention, the recommendation software uses a proprietary clustering algorithm to form the user interest folders. The clustering algorithm uses the textual content of the documents viewed by a user, in combination with structural information about the document server, and ancillary information about the user to determine the interest folders for a user" (Column 13, lines 10-16), and **"displaying the plurality of documents in said hierarchical format of plural levels of clusters based on a result of clustering the plurality of documents"** as "One significant feature of the clustering algorithm used by the invention is that the output of the algorithm can be readily viewed and understood. Each document cluster (interest folder) is described by the most relevant keywords of the documents within the document cluster 510. This feature enables both users and marketers to understand and control the degree of personalization and targeting that is made" (Column 13, lines 22-28) and "FIG. 6 is an example of a user profile 600 generated by the recommendation software, according to

the preferred embodiment of the present invention. The profile shown in the personalized Web page of FIG. 6 comprises two different interest folders 602, 604 for a user of an on-line auction Web site. Each interest folder contains pages which are intrinsically similar to one another and dissimilar to pages in other interest folders. A specific interest folder contains a set of links 610 to auctions the user has viewed that are related to the theme of the interest folder. An interest folder can also include additional information including but not limited to information regarding the history of the user's Internet viewing, recommendations for the user, a summary of the user's purchases. In the example illustrated in FIG. 6, each interest folder also has an associated set of keywords 612 that summarize the most important concepts of the particular interest folder, as determined by the recommendation software" (Column 14, lines 30-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Oliver's** would have allowed **Bellegarda's** to provide a method o provide automated organization for users, as noted by **Oliver** (Column 3, lines 23-32).

Regarding claim 48, **Bellegarda** further teaches a method comprising:
A) wherein the multiple threshold values are characteristic values of clusters from said clustering (Page 1284).

The examiner notes that **Bellegarda** teaches **"wherein the multiple threshold values are characteristic values of clusters from said clustering"** as "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck, 1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284).

Regarding claim 50, **Bellegarda** further teaches a graphical user interface comprising:

A) wherein the multiple threshold values are characteristic values of clusters from said clustering (Page 1284).

The examiner notes that **Bellegarda** teaches **"wherein the multiple threshold values are characteristic values of clusters from said clustering"** as "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck, 1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284).

Regarding claim 52, **Bellegarda** further teaches a computer readable media comprising:

A) wherein the multiple threshold values are characteristic values of clusters from said clustering (Page 1284).

The examiner notes that **Bellegarda** teaches **"**wherein the multiple threshold values are characteristic values of clusters from said clustering**"** as "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck, 1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284).

Regarding claim 54, **Bellegarda** further teaches a computer system comprising:
A) wherein the multiple threshold values are characteristic values of clusters from said clustering (Page 1284).

The examiner notes that **Bellegarda** teaches **"wherein the multiple threshold values are characteristic values of clusters from said clustering"** as "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck, 1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284).

Regarding claim 56, **Bellegarda** further teaches a method comprising:
A) wherein the multiple threshold values are characteristic values of clusters from said clustering (Page 1284).

The examiner notes that **Bellegarda** teaches **"wherein the multiple threshold values are characteristic values of clusters from said clustering"** as "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck, 1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284).

6. Claims 9-10, 25-26, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bellegarda et al.** (Article entitled "Exploiting Latent Semantic

Information in Statistical Language Modeling, dated 10/26/2000) and in view of **Oliver et al.** (U.S. Patent 7,158,986) as applied to claims 1-7, 11, 13-16, 17-23, 27-28, 30-34, 37-38, 48, 50, 52, 54, and 56 above, and further in view of **Kusama** (U.S. Patent 7,085,767).

7. Regarding claim 9, **Bellegarda** and **Oliver** do not explicitly teach a method comprising:

A) including the step of automatically labeling the clusters based on the resulting clusters.

Kusama, however teaches **"including the step of automatically labeling the clusters based on the resulting clusters"** as "the "Title" of "cardinfo.xml" is read, and the folder having the same name as the meta data being saved in the "Title" are generated at a predetermined location in the binary data storage device. According to this processing, in the case where this, for example, the meta data "cardinfo.xml" depicted in FIG. 10, then the folder having the name of "Party" which is written in the "Title" is generated" (Column 5, lines 46-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Kusama's** would have allowed **Bellegarda's** and **Oliver's** to provide a method for users to find and file documents in multiple locations in order to generate/copy data by automatically devising a folder name in order to lessen the burden of having to conform to the content of the data, as noted by **Kusama** (Column 1, lines 34-38).

Regarding claim 10, **Bellegarda** and **Oliver** do not explicitly teach a method comprising:

A) wherein said labeling comprises selecting representative words based on the closeness of their vectors to the document vectors in a cluster.

Kusama, however teaches **"wherein said labeling comprises selecting representative words based on the closeness of their vectors to the document vectors in a cluster"** as "the "Title" of "cardinfo.xml" is read, and the folder having the same name as the meta data being saved in the "Title" are generated at a

predetermined location in the binary data storage device. According to this processing, in the case where this, for example, the meta data "cardinfo.xml" depicted in FIG. 10, then the folder having the name of "Party" which is written in the "Title" is generated" (Column 5, lines 46-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Kusama's** would have allowed **Bellegarda's** and **Oliver's** to provide a method for users to find and file documents in multiple locations in order to generate/copy data by automatically devising a folder name in order to lessen the burden of having to conform to the content of the data, as noted by **Kusama** (Column 1, lines 34-38).

Regarding claim 25, **Bellegarda** and **Oliver** do not explicitly teach a computer-readable media comprising:

A) wherein said computer-executable code performs step of automatically labeling the clusters based on the resulting clusters.

Kusama, however teaches **"wherein said computer-executable code performs step of automatically labeling the clusters based on the resulting clusters"** as "the "Title" of "cardinfo.xml" is read, and the folder having the same name as the meta data being saved in the "Title" are generated at a predetermined location in the binary data storage device. According to this processing, in the case where this, for example, the meta data "cardinfo.xml" depicted in FIG. 10, then the folder having the name of "Party" which is written in the "Title" is generated" (Column 5, lines 46-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Kusama's** would have allowed **Bellegarda's** and **Oliver's** to provide a method for users to find and file documents in multiple locations in order to generate/copy data by automatically devising a folder name in order to lessen the burden of having to conform to the content of the data, as noted by **Kusama** (Column 1, lines 34-38).

Regarding claim 26, **Bellegarda** and **Oliver** do not explicitly teach a computer-readable media comprising:

A) wherein said labeling comprises selecting representative words based on the closeness of their vectors to the document vectors in a cluster.

Kusama, however teaches **"wherein said labeling comprises selecting representative words based on the closeness of their vectors to the document vectors in a cluster"** as "the "Title" of "cardinfo.xml" is read, and the folder having the same name as the meta data being saved in the "Title" are generated at a predetermined location in the binary data storage device. According to this processing, in the case where this, for example, the meta data "cardinfo.xml" depicted in FIG. 10, then the folder having the name of "Party" which is written in the "Title" is generated" (Column 5, lines 46-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Kusama's** would have allowed **Bellegarda's** and **Oliver's** to provide a method for users to find and file documents in multiple locations in order to generate/copy data by automatically devising a folder name in order to lessen the burden of having to conform to the content of the data, as noted by **Kusama** (Column 1, lines 34-38).

Regarding claim 35, **Bellegarda** and **Oliver** do not explicitly teach a computer system comprising:

A) wherein said processor automatically labels the clusters based on the resulting clusters.

Kusama, however teaches **"wherein said processor automatically labels the clusters based on the resulting clusters"** as "the "Title" of "cardinfo.xml" is read, and the folder having the same name as the meta data being saved in the "Title" are generated at a predetermined location in the binary data storage device. According to this processing, in the case where this, for example, the meta data "cardinfo.xml" depicted in FIG. 10, then the folder having the name of "Party" which is written in the "Title" is generated" (Column 5, lines 46-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Kusama's** would have allowed **Bellegarda's** and **Oliver's** to provide a method for users to find and file documents in multiple locations in order to generate/copy data by automatically devising a folder name in order to lessen the burden of having to conform to the content of the data, as noted by **Kusama** (Column 1, lines 34-38).

Regarding claim 36, **Bellegarda** and **Oliver** do not explicitly teach a computer system comprising:

A) wherein said processor labels the clusters by selecting representative words based on the closeness of their vectors to the document vectors in a cluster.

Kusama, however teaches **"wherein said processor labels the clusters by selecting representative words based on the closeness of their vectors to the document vectors in a cluster"** as "the "Title" of "cardinfo.xml" is read, and the folder having the same name as the meta data being saved in the "Title" are generated at a predetermined location in the binary data storage device. According to this processing, in the case where this, for example, the meta data "cardinfo.xml" depicted in FIG. 10, then the folder having the name of "Party" which is written in the "Title" is generated" (Column 5, lines 46-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Kusama's** would have allowed **Bellegarda's** and **Oliver's** to provide a method for users to find and file documents in multiple locations in order to generate/copy data by automatically devising a folder name in order to lessen the burden of having to conform to the content of the data, as noted by **Kusama** (Column 1, lines 34-38).

8. Claims 49, 51, 53, 55, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bellegarda et al.** (Article entitled "Exploiting Latent Semantic Information in Statistical Language Modeling, dated 10/26/2000) and in view of **Oliver et al.** (U.S. Patent 7,158,986) as applied to claims 1-7, 11, 13-16, 17-23, 27-28, 30-34,

37-38, 48, 50, 52, 54, and 56 above, and further in view of **Hertz** (U.S. PGPUB 2003/0037041).

9. Regarding claims, 49, 51, 53, 55, and 57, **Bellegarda** and **Oliver** do not explicitly teach a method, graphical user interface, computer-readable media, computer system, and computer comprising:

A) wherein the characteristic values of the clusters are cluster variances of the clusters.

Hertz, however, teaches **"wherein the characteristic values of the clusters are cluster variances of the clusters"** as "a real number determined by calculating the statistical variance of the profiles of all target objects in a cluster, is termed a "cluster variance,"" (Paragraph 13) and "The threshold used in step 6 is typically an affine function or other function of the greater of the cluster variances (or cluster diameters) of S and T" (Paragraph 326).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Hertz's** would have allowed **Bellegarda's** and **Oliver's** to provide for a more efficient method in gathering data that interests users, as noted by **Hertz** (Paragraph 11).

Response to Arguments

10. Applicant's arguments filed 08/28/2009 have been fully considered but they are not persuasive.

Applicant argues on page 13 that "**Such sequence of clustering stages in Bellegarda, however, is not used to cluster the documents. In other words, after performing the sequences of clustering stages as disclosed in page 1284 of Bellegarda, the documents remain in a single collection, and are not clustered. Neither the sequences of clustering stages as disclosed in page 1284 of Bellegarda nor the remaining disclosure in Bellegarda teaches or suggests clustering the files within said space, wherein multiple threshold values that are settable to desired levels of granularity are defines, and said files are clustered based on said multiple threshold values"**. However, the examiner wishes to refer to page 1284 of Bellegarda which "Once (11) is specified, it is straightforward to proceed with the clustering of the word vectors , using any of a variety of algorithms (see, for

instance, [2]). Since the number of such vectors is relatively large, it is advisable to perform this clustering in stages, using, for example, K-means and bottom-up clustering sequentially. In that case, K-means clustering is used to obtain a coarse partition of the vocabulary in to a small set of superclusters. Each supercluster is then itself partitioned using bottom-up clustering, resulting in a final set of clusters Ck, 1<=k<=K, . This process can be thought of as uncovering, in a data-driven fashion, a particular layer of semantic knowledge in the space" (1284). The examiner further wishes to state that because Bellegarda teaches the argued "superclusters", then as a result, Bellegarda teaches the equivalently claimed multiple threshold values. Moreover, because the combination of Bellegarda and Olliver teaches displaying the hierarchical relationships, then as a result, the aforementioned limitation is taught. Moreover, because the formula with which the superclusters are based on are over a settable range of "Ck<=k<=K, then as a result, a user can set to whatever granularity he chooses to". The examiner further wishes to states that **Bellegarda** is clearly the same scope and foundation of the instant invention. Given that the exact same formulas appear in both the instant application and the cited art, for applicant to argue that **Bellegarda** does not teach the claimed clustering is without merit.

Applicants argue on page 13 that **"Oliver does not teach or suggest deriving a hierarchy from the clusters that has multiple levels. Oliver merely discloses individual document clusters, or interest folders, in a disjointed manner. However, Oliver does not have any disclosure of any relationship between folders, as would be indicated by a hierarchy"**. However, The examiner wishes to refer to Figures 6-7 of **Oliver** which depict a GUI of interest folders that are clearly related to another in that they deal with online auctions. Figure 7 clearly states "5 recommended auctions for each user interest folder". The folders are clearly related because they both deal with auction items.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 6,820,094 issued to **Ferguson et al.** on 16 November 2004. The subject matter disclosed therein is pertinent to that of claims 1-11, 13-23, 25-28, 30-33, and 35-38 (e.g., methods to use to smart folders to automatically organize and relate relevant files).

U.S. PGPUB 2004/0249865 issued to **Lee et al.** on 09 December 2004. The subject matter disclosed therein is pertinent to that of claims 1-11, 13-23, 25-28, 30-33, and 35-38 (e.g., methods to automatically name and label folders).

U.S. PGPUB 2004/0148453 issued to **Watanabe et al.** on 29 July 2004. The subject matter disclosed therein is pertinent to that of claims 1-11, 13-23, 25-28, 30-33, and 35-38 (e.g., methods to automatically name and label folders).

U.S. Patent 5,819,258 issued to **Vaithyanathan et al.** on 06 October 1998. The subject matter disclosed therein is pertinent to that of claims 1-11, 13-23, 25-28, 30-33, and 35-38 (e.g., methods to use to smart folders to automatically organize and relate relevant files).

U.S. Patent 6,360,227 issued to **Aggarwal et al.** on 19 March 2002. The subject matter disclosed therein is pertinent to that of claims 1-11, 13-23, 25-28, 30-33, and 35-38 (e.g., methods to use to smart folders to automatically organize and relate relevant files).

U.S. Patent 5,899,995 issued to **Millier et al.** on 04 May 1999. The subject matter disclosed therein is pertinent to that of claims 1-11, 13-23, 25-28, 30-33, and 35-38 (e.g., methods to use to smart folders to automatically organize and relate relevant files).

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahesh Dwivedi whose telephone number is (571) 272-2731. The examiner can normally be reached on Monday to Friday 8:20 am – 4:40 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached (571) 272-3642. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mahesh Dwivedi
Patent Examiner
Art Unit 2168

January 14, 2010
/Mahesh H Dwivedi/
Examiner, Art Unit 2168

/Tim T. Vo/
Supervisory Patent Examiner, Art Unit 2168